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EXAMINER

SHOSHO, CALLIE E

ART UNIT

PAPER NUMBER

1714

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/686,825

Applicant(s)

WANG ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/16/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 and 4-16 of copending Application No. 10/446,013. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following explanation.

Copending 10/446,013 discloses ink jet ink comprising water, 5-60% or 10-50% humectant, and up to 20% or up to 10% composite colorant particles wherein the composite colorant particles have a pigment phase and a polymer phase wherein the polymer phase is formed in situ, wherein a portion of an addition polymerization initiator is added to an aqueous

colorant mixture before adding a monomer mixture to the colorant mixture, wherein the aqueous colorant mixture contains no monomer which is used to form the polymer phase, and wherein the composite colorant particles do not increase in mean particle size more than about 18% or 10% when ink is incubated for one week at 60 °C. It is further disclosed that the pigment includes Pigment Blue 15:3, Pigment Red 122, Pigment Yellow 155, or Pigment Black 7. The polymer is made from monomers identical to those presently claimed and is crosslinked. The composite colorant pigment particles have mean particle size less than 200 nm or 80 nm. The ratio of colorant phase to polymer phase in the composite polymer particles is 30:70 to 70:30. There is also disclosed a process for making the composite colorant polymer particles identical to that presently claimed.

The differences between copending 10/446,013 and the present claimed invention is (a) present claims require 10-90% organic solvent while copending claims require 5-60% or 10-50% humectant, (b) copending claims require water while present claims are silent with respect to water, (c) copending claims recite that the composite colorant particles do not increase in mean particle size more than about 18% or 10% when ink is incubated for one week at 60 °C while present claims are silent with respect to such limitation, and (d) present claims require molecular weight of the composite colorant polymer particles while copending claims are silent with respect to molecular weight.

With respect to difference (a), it is noted that while the present claims disclose that the ink comprises organic solvent, the copending claims disclose that the ink requires humectant.

Applicants' attention is drawn to MPEP 804 where it is disclosed that "the specification can always be used as a dictionary to learn the meaning of a term in a patent claim." *In re*

Boylan, 392 F.2d 1017, 157 USPQ 370 (CCPA 1968). Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. (underlining added by examiner for emphasis) *In re Vogel*, 422 F.2d 438, 164 USPQ 619,622 (CCPA 1970).

Consistent with the above underlined portion of the MPEP citation, attention is drawn to page 12, lines 8-10 and 13-15 of copending 10/446,013 which discloses that the humectant includes triethylene glycol, diethylene glycol, glycerol, ethylene glycol, and propylene glycol which are identical to the organic solvents utilized in the present claims.

Further, with the present claims require 10-90% organic solvent and the copending claims require 5-60% or 10-50% humectant, it is noted that as set forth in MPEP 2144.05, in the case where the claimed range “overlap or lie inside ranges disclosed by the prior art”, a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Consistent with the above underlined portion of the MPEP citation as cited above, attention is drawn to page 19, lines 5-10 of copending 10/446,013 which discloses that a typical ink contains humectant, i.e. triethylene glycol and glycerol, in amount of 33%.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art that the humectant of the copending claims is the same as the organic solvent as the present claims and to choose amounts of humectant, including those presently claimed, in order to produce ink that does not dry out or clog the printer nozzles, and thereby arrive at the present invention from the copending one.

With respect to difference (b), while there is no disclosure in the present claims of water, in light of the open language of the present claims, i.e. “comprising”, it is clear that the present claims are open to the inclusion of additional ingredients including water as disclosed by copending 10/446,013.

With respect to difference (c), the copending claims require that that the composite colorant particles do not increase in mean particle size more than about 18% or 10% when ink is incubated for one week at 60 °C. While there is no such requirement in the present claims, given that the composite colorant polymer particles of the present invention are made from the same types of monomer using the same process as is the composite colorant polymer particles of the copending claims, it is clear that the composite colorant polymer particles of the present claims would inherently not increase in mean particle size more than about 18% or 10% when ink is incubated for one week at 60 °C.

With respect to difference (d), it is noted that the copending claims are silent with respect to the molecular weight of the composite colorant polymer particles. However, given that the composite colorant polymer particles of copending 10/446,013 are obtained from the same types of monomer using the same process as presently claimed and given that the composite colorant polymer particles of copending 10/446,013 comprise same ratio of colorant to polymer as presently claimed, it is clear that the composite colorant polymer particles of the copending claims would inherently possess molecular weight as presently claimed.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to arrive at the present claims from the copending ones.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1-14 are directed to an invention not patentably distinct from claims 1-2 and 4-16 of commonly assigned 10/446,013. Specifically, while the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 2 above.

4. The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP § 2302).

Commonly assigned 10/446,013, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

5. Claims 1-14 are provisionally rejected under 35 U.S.C. 103(a) as being obvious over copending Application No. 10/446,013 which has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the copending application, it would constitute prior art under 35 U.S.C. 102(e) if published or patented. This provisional rejection under 35 U.S.C. 103(a) is based upon a presumption of future publication or patenting of the conflicting application. For an explanation of the rejection, see paragraph 2 above.

This provisional rejection might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention "by another," or by a showing of a date of invention for the instant application prior to the effective U.S. filing date of the copending application under 37 CFR 1.131. This rejection might also be overcome by showing that the copending application is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Oath/Declaration

6. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the citizenship of each inventor. Specifically, there is no citizenship identified for inventor Edward Schofield.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. '693 (U.S. 6,635,693).

Wang et al. '693 discloses ink comprising organic solvent such as diethylene glycol, triethylene glycol, and glycerol and up to 30%, preferably, 0.5-15% composite colorant polymer particles comprising colorant phase comprising pigment such as Pigment Blue 15:3, Pigment Red 122, Pigment Yellow 155, and Pigment Black 7 and polymer phase that is formed in situ in the presence of colorant and is formed from monomers including (meth)acrylic acid, styrene, vinyl acetate, butadiene, and isoprene. It is disclosed that the polymer is crosslinked. The composite colorant polymer particles possesses mean particle size less than 200 nm, preferably less than 80 nm and molecular weight greater than 10,000. The ratio of the colorant phase to the polymer phase is 30:70 to 70:30. It is disclosed that a typical ink comprises 33% humectant. There is also disclosed process for making the composite colorant polymer particles that comprises suspending in an aqueous medium, under agitation, finely divided colorant particles to form aqueous colorant mixture, adding to the aqueous colorant mixture an addition

polymerization initiator, and then causing the addition polymerization initiator to form a free radical while continuously adding to the aqueous colorant mixture a monomer mixture comprising an addition polymerization initiator and ethylenically unsaturated monomer.

In light of the above, it is clear that Wang et al. '693 anticipate the present claims.

9. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. '614 (U.S. 2003/0199614).

Wang et al. '614 discloses ink jet ink comprising water, 5-60% or 10-50% humectant such as diethylene glycol, triethylene glycol, glycerol, propylene glycol, and ethylene glycol, and up to 20% or up to 10% composite colorant particles wherein the composite colorant particles have a pigment phase and a polymer phase wherein the polymer phase is formed in situ in the presence of the pigment. It is further disclosed that the pigment includes Pigment Blue 15:3, Pigment Red 122, Pigment Yellow 155, or Pigment Black 7. The polymer is made from monomers identical to those presently claimed. It is disclosed that the polymer is crosslinked. The composite pigment particles have mean particle size less than 200 nm or 80 nm. The ratio of colorant phase to polymer phase in the composite polymer particles is 30:70 to 70:30. There is also disclosed process for making the composite colorant polymer particles that comprises suspending in an aqueous medium, under agitation, finely divided colorant particles to form aqueous colorant mixture, adding to the aqueous colorant mixture an addition polymerization initiator, and then causing the addition polymerization initiator to form a free radical while continuously adding to the aqueous colorant mixture a monomer mixture comprising an addition polymerization initiator and ethylenically unsaturated monomer (paragraphs 4, 23, 33, 35, 40, 43,

and claims 2-13). Although there is no explicit disclosure of the molecular weight of the composite colorant polymer particles, given that Wang et al. '614 discloses that the composite colorant polymer particles are obtained from the same types of monomers using the same process as presently claimed and given that the composite colorant polymer particles of Wang et al. '614 comprise same ratio of colorant to polymer as presently claimed, it is clear that the composite colorant polymer particles of Wang et al. '614 would inherently possess molecular weight as presently claimed.

In light of the above, it is clear that Wang et al. '614 anticipates the present claims.

10. Claims 1-10 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin (U.S. 5,281,261) taken in view of the evidence given in Noguchi et al. (U.S. 5,658,376) and Kovacs et al. (U.S. 5,932,630).

Lin discloses ink jet ink comprising water, 0.1-50% solvent such as ethylene glycol and diethylene glycol, and 0.01-15% composite colorant polymer particles, i.e. modified pigment particle, obtained by polymerizing at least one monomer in the presence of colorant in situ. The monomers include styrene. The colored resin particles have average particle size of less than 1 μm . The ratio of colorant to polymer is 1:9 to 9:1. Lin discloses producing the modified pigment particle by adding aqueous initiator to pigment dispersion which is then added to monomer/initiator mixture (col.1, lines 8-22 and 40-44, col.5, line 60, col.5, line 65-col.6, line 46, col.7, lines 20-27 and 40-42, col.9, lines 15-26 and 57-65, col.10, lines 4-15, col.12, lines 54-59, col.1,2 line 41-col.13, line 16, col.13, lines 10-16, 44-47, and 54-59, and examples VIB and IX).

Attention is drawn to col.6, lines 60-61 and col.7, line 5 of Lin which discloses that the pigments include Heliogen Blue D7080 and Hostaperm Pink E. It is well known, as evidenced by Kovacs et al. (col.11, lines 46-47) and Noguchi et al. (col.18, lines 33-34), that Heliogen Blue D7080 and Hostaperm Pink E are tradenames for Pigment Blue 15:3 and Pigment Red 122, respectively.

In light of the above, it is clear that Lin anticipates the present claims.

11. Claims 1-2 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Shintani et al. (U.S. 4,623,689).

Shintani et al. disclose an ink jet ink comprising water, 5-50% solvent, and composite colorant polymer particles, i.e. colored polymer, wherein the polymer is formed in the presence of colorant in situ wherein the colored polymer is obtained from monomers such as vinyl chloride, butadiene, isoprene, acrylonitrile, alkyl (meth)acrylate, and styrene. The polymer has average particle size of less than 0.3 μm , or for instance, 0.12 μm . The polymer is formed by a process comprising mixing colorant and initiator in water under heat to which is added monomer mixture and aqueous solution of initiator (col.2, line 60-col.3, line 42, col.3, lines 49-50, col.5, lines 25-26, col.7, lines 33-42, col.9, lines 7-12, 24-28, and 54-55, col.10, lines 26-34, and example 35).

In light of the above, it is clear that Shintani et al. anticipates the present claims.

12. Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 1006161.

EP 1006161 discloses ink jet ink comprising water, 0.1-30% solvent such as ethylene glycol, diethylene glycol, and diethylene glycol monobutyl ether, and 1-20% composite colorant polymer particles, i.e. polymer covering colorant, wherein the polymer is formed by polymerizing monomer in the presence of colorant in situ. The monomers include (meth)acrylic acid, (meth)acrylonitrile, vinyl acetate, alkyl (meth)acrylate, styrene, and maleic acid as well as crosslinking monomers such as divinylbenzene while the colorant is pigment including Pigment Blue 15:3. The polymer has particle diameter of 50-200 nm and molecular weight of 1000-50,000. The ratio of colorant to polymer is 5-90:10-95 or 0.05:1 to 9:1 (page 15, lines 55-58, page 16, line 44-page 17, line 8, page 17, lines 16-17, 19, 23, 32-33, 34-35, 37-49, and 52-54, page 18, lines 15-25, page 24 lines 24-41, and page 33, lines 22-23).

In light of the above, it is clear that EP 1006161 anticipates the present claims.

13. Claims 1-2 and 5-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Idogawa et al. (U.S. 5,965,634).

Idogawa et al. disclose ink jet ink comprising water, 10-80% solvent such as ethylene glycol, diethylene glycol, glycerol, and diethylene glycol monobutyl ether, and 3-30% composite colorant polymer particles, i.e. colored resin particles, obtained by polymerizing at least one vinyl monomer in the presence of colorant in situ. The monomers include styrene, alkyl (meth)acrylate, vinyl acetate, butadiene, and isoprene, as well as crosslinking monomers. The colored resin particles have particle diameter of less than 0.5 μm (col.1, lines 5-9, col.2, lines 25-37 and 54-62, col.3, lines 2-4, 10-12, and 16-38, col.4, lines 16-43, col.5, lines 18-21, and example 1).

In light of the above, it is clear that Idogawa et al. anticipate the present claims.

14. **NOTE:** It is noted that there is no disclosure in Idogawa et al. or EP 10061161 of process as required in present claim 2. However, “even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself”. See MPEP 2113.

Thus, although neither Idogawa et al. or EP 10061161 disclose the presently claimed process for making the composite colorant polymer particles, it is noted that “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) . Further, “although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product”, *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983).

Therefore, absent evidence of criticality regarding the presently process and given that Idogawa et al. and EP 10061161 each meet the requirements of the claimed composite colored polymer particles, it is clear that Idogawa et al. and EP 10061161 each meet the requirements of present claim 2.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shintani et al. (U.S. 4,623,659) in view of EP 1006161.

The disclosure with respect to Shintani et al. in paragraph 11 above is incorporated here by reference.

The difference between Shintani et al. and the present claimed invention is the requirement in the claims of the amount of polymer.

EP 1006161, which is drawn to ink jet ink comprising composite colorant polymer particles, disclose the use of 1-20% composite colorant polymer particles wherein it is disclosed that if the composite colorant polymer particles are added in this range, good ejection stability is provided in ink jet recording (col.16, lines 34-36).

In light of the motivation for using specific amount of polymer in composite colorant polymer particles disclosed by EP 1006161 as described above, it therefore would have been obvious to one of ordinary skill in the art to use this amount of polymer in the composite colorant polymer particles of Shintani et al. in order to produce ink with good ejection stability, and thereby arrive at the claimed invention.

18. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. 5,281,261) or Shintani et al. (U.S. 4,623,659) either of which in view of Miyabayashi et al. (U.S. 6,271,285).

The disclosures with respect to Lin and Shintani et al. in paragraphs 10 and 11 respectively, are incorporated here by reference.

The difference between to Lin or Shintani et al. and the present claimed invention is the requirement in the claims of that the polymer is crosslinked.

Miyabayashi et al., which is drawn to ink jet ink, disclose using a crosslinked polymer given that such polymer permits wettability of the surface of the nozzle plate by the ink composition to be further reduced which allows the ink to be more stably ejected (col.4, lines 50-57).

In light of the motivation for using crosslinked polymer disclosed by Miyabayashi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the composite colorant polymer particles of either Lin or Shintani et al. in order to produce ink which is stably ejected from printer, and thereby arrive at the claimed invention.

19. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. 5,281,261), Idogawa et al. (U.S. 5,965,634), or Shintani et al. (U.S. 4,623,659) any of which in view of Tabayashi et al. (U.S. 6,074,467).

The disclosures with respect to Lin, Shintani et al., and Idogawa et al. in paragraphs 10, 11, and 13, respectively, are incorporated here by reference.

The difference between to Lin, Shintani et al., or Idogawa et al. and the present claimed invention is the requirement in the claims of the molecular weight of the composite colored polymer particles.

Tabayashi et al., which is drawn to ink containing composite colorant polymer particles, disclose that the polymer has molecular weight of 10,000-100,000 and that if the molecular weight is less than 10,000, the polymer will insufficiently cover the colorant and the printed ink will suffer from poor water proof quality (col.8, lines 45-59).

In light of the motivation for using polymer with specific molecular weight disclosed by Tabayashi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the composite colorant polymer particles of either Lin, Shintani et al., or Idogawa et al. in order to produce ink which has good waterfastness, and thereby arrive at the claimed invention.

20. Claims 1-2 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idogawa et al. (U.S. 5,965,634).

Idogawa et al. disclose ink jet ink comprising water, 10-80% solvent such as ethylene glycol, diethylene glycol, glycerol, and diethylene glycol monobutyl ether, and 3-30% composite colorant polymer particles, i.e. colored resin particles, obtained by polymerizing at least one vinyl monomer in the presence of colorant in situ. The monomers include styrene, alkyl (meth)acrylate, vinyl acetate, butadiene, and isoprene, as well as crosslinking monomers. The colored resin particles have particle diameter of less than 0.5 μm (col.1, lines 5-9, col.2, lines 25-37 and 54-62, col.3, lines 2-4, 10-12, and 16-38, col.4, lines 16-43, col.5, lines 18-21, and example 1).

It is noted that the present claims require composite colorant polymer particles wherein the mean particle size is less than about 200 nm while Idogawa et al. disclose composite colorant polymer particles wherein the mean particle size is less than 500 nm.

As set forth in MPEP 2144.05, in the case where the claimed range “overlap or lie inside ranges disclosed by the prior art”, a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed.

Cir. 1990). Further col.3, lines 5-15 of Idogawa et al. disclose that the particle size of the composite colorant polymer particles is such that the colored particles do not flocculate or precipitate in order to prevent clogging of the printer nozzles.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use composite colorant polymer particle in Idogawa et al. with mean particle size, including that presently claimed, in order to produce ink that will not clog the printer nozzles, and thereby arrive at the claimed invention.

21. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idogawa et al. as applied to claims 1-2 and 5-11 above, and further in view of Tabayashi et al. (U.S. 6,074,467).

The difference between Idogawa et al. and the present claimed invention is the requirement in the claims of the molecular weight of the composite colored polymer particles.

Tabayashi et al., which is drawn to ink containing composite colorant polymer particles, disclose that the polymer has molecular weight of 10,000-100,000 and that if the molecular weight is less than 10,000, the polymer will insufficiently cover the colorant and the printed ink will suffer from poor water proof quality (col.8, lines 45-59).

In light of the motivation for using polymer with specific molecular weight disclosed by Tabayashi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the composite colorant polymer particles of Idogawa et al. in order to produce ink which has good waterfastness, and thereby arrive at the claimed invention.

22. Claims 1-10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. 5,281,261) in view of Noguchi et al. (U.S. 5,658,376) and Kovacs et al. (U.S. 5,932,630).

Lin discloses ink jet ink comprising water, 0.1-50% solvent such as ethylene glycol and diethylene glycol, and 0.01-15% composite colorant polymer particles, i.e. modified pigment particle, obtained by polymerizing at least one monomer in the presence of colorant in situ. The monomers include styrene. The colored resin particles have average particle size of less than 1 μm . The ratio of colorant to polymer is 1:9 to 9:1. Lin discloses producing the modified pigment particle by adding aqueous initiator to pigment dispersion which is then added to monomer/initiator mixture (col.1, lines 8-22 and 40-44, col.5, line 60, col.5, line 65-col.6, line 46, col.7, lines 20-27 and 40-42, col.9, lines 15-26 and 57-65, col.10, lines 4-15, col.12, lines 54-59, col.1,2 line 41-col.13, line 16, col.13, lines 10-16, 44-47, and 54-59, and examples VIB and IX).

Attention is drawn to col.6, lines 60-61 and col.7, line 5 of Lin which discloses that the pigments include Heliogen Blue D7080 and Hostaperm Pink E. It is well known, as evidenced by Kovacs et al. (col.11, lines 46-47) and Noguchi et al. (col.18, lines 33-34), that Heliogen Blue D7080 and Hostaperm Pink E are tradenames for Pigment Blue 15:3 and Pigment Red 122, respectively.

It is noted that the present claims require composite colorant polymer particles wherein the mean particle size is less than about 200 nm while Lin discloses composite colorant polymer particles wherein the mean particle size is less than 1000 nm.

As set forth in MPEP 2144.05, in the case where the claimed range "overlap or lie inside ranges disclosed by the prior art", a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed.

Cir. 1990). Further col.7, lines 20-27 of Lin discloses that the mean particle size of the composite colorant polymer particles should be as small as possible in order to enable stable colloidal dispersion of the particles in the liquid vehicle and to prevent unnecessary clogging of the ink jet printer.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use composite colorant polymer particle in Lin with mean particle size, including that presently claimed, in order to produce ink that will not clog the printer nozzles, and thereby arrive at the claimed invention.

23. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Noguchi et al. and Kovacs et al. as applied to claims 1-10 and 14 above, and further in view of Miyabayashi et al. (U.S. 6,271,285).

The difference between to Lin in view of Noguchi et al. and Kovacs et al. and the present claimed invention is the requirement in the claims of that the polymer is crosslinked.

Miyabayashi et al., which is drawn to ink jet ink, disclose using a crosslinked polymer given that such polymer permits wettability of the surface of the nozzle plate by the ink composition to be further reduced which allows the ink to be more stably ejected (col.4, lines 50-57).

In light of the motivation for using crosslinked polymer disclosed by Miyabayashi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the composite colorant polymer particles of Lin in order to produce ink which is stably ejected from printer, and thereby arrive at the claimed invention.

24. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Noguchi et al. and Kovacs et al. as applied to claims 1-10 and 14 above, and further in view of Tabayashi et al. (U.S. 6,074,467).

The difference between to Lin in view of Noguchi et al. and Kovacs et al. and the present claimed invention is the requirement in the claims of the molecular weight of the composite colored polymer particles.

Tabayashi et al., which is drawn to ink containing composite colorant polymer particles, disclose that the polymer has molecular weight of 10,000-100,000 and that if the molecular weight is less than 10,000, the polymer will insufficiently cover the colorant and the printed ink will suffer from poor water proof quality (col.8, lines 45-59).

In light of the motivation for using polymer with specific molecular weight disclosed by Tabayashi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the composite colorant polymer particles of Lin in order to produce ink which has good waterfastness, and thereby arrive at the claimed invention.

Response to Preliminary Amendment

25. The present application is a CIP of parent application 09/946,419. In the preliminary amendment filed 10/16/03, applicants noted that comparative example 3 has been added to this CIP in order to show the advantage of solvent based ink jet ink over aqueous ink jet ink.

However, the data set forth in comparative example 3 is not persuasive for the following reasons.

Firstly, it is noted that there is no requirement in the present claims that the ink is solvent based. The present claims only require ink comprising organic solvent. This broad disclosure clearly encompasses both solvent-based and water-based inks. While present claim 8 discloses amount of organic solvent utilized, it is noted that the amount, i.e. 10-90%, would not require a solvent-based ink. When the amount of organic solvent present is, for instance, 10%, the ink would not be solvent-based.

Further, while page 13, lines 4-15 of the present specification discloses preparation of polymer colorant particle C-3 wherein no organic solvent is used and Table 2 comprises examples 1-9 and C-1, C-2, and C-3, it is not clear what example C-3 comprises. That is, page 14, lines 9-14 of the present specification discloses that dispersions 1-9, C-1, and C-2 are added to 10g mineral oil and 1g stearic acid and that in these examples, the organic solvents comprise more than 51% of the ink. However, there is no similar disclosure of how the dispersion of comparative example C-3 is utilized. Is dispersion C-3 added to water? Does example C-3 in Table 2 represent a water-based ink wherein the water comprises more than 51% of the ink? Clarification is requested.

Further, there is not proper side-by-side comparison between the dispersion of comparative example C-3 and dispersion of example 1. Specifically, while dispersion C-3 does not contain any solvent, there is also no disclosure of adding initiator to the pigment dispersion before adding the monomer/initiator mixture when preparing the composite colorant polymer particle. Thus, it is not clear if the differences between example 1 and comparative example C-3 as set forth in Table 2 are due to the use of solvent or due to the difference in the method used to prepare the composite colorant polymer particle.

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26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kase et al. (U.S. 6,034,154) disclose ink comprising water, solvent, and composite colorant polymer particle possessing mean particle size of 10-500 nm.

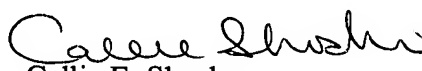
EP 1055712 disclose ink comprising water, solvent, and colored resin possessing mean particle size of 50-800 nm.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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11/28/05


Callie E. Shosho
Primary Examiner
Art Unit 1714